

REMARKS/ARGUMENTS

Summary of the Examiner's Actions

The examiner rejected Claims 1-10 and 12-25 under 35 U.S.C. § 103(a). Specifically, the examiner rejected claims 1-3, 7-10, 12 and 14-16 as being unpatentable over U. S. Patent No. 6,245,184 ("the '184 patent"), issued to Riedner *et al.*, in view of U. S. Patent No. 6,236,710 ("the '710 patent"), issued to Wittry. Claims 4-6 and 17-25 were rejected as being unpatentable over the '184 patent in view of the '184 and '710 patents, and further in view of U. S. Patent No. 4,879,465 ("the '465 patent"), issued to Persyk *et al.* Applicants acknowledge the rejection under 35 U.S.C. § 103(a).

Rejections under 35 U.S.C. § 103(a)

In order to support a rejection under 35 U.S.C. § 103(a), "the examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness." MPEP § 2142, pg. 2100-121, 8th ed. "To reach a proper determination under 35 U.S.C. § 103(a), the examiner must step backward in time and into the shoes worn by the hypothetical 'person of ordinary skill in the art' when the invention was unknown and just before it was made." *Id.* The first element in establishing a *prima facie* case of obviousness is that "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings." MPEP § 2143, pg. 2100-122, 8th ed. The second element is that there "must be a reasonable expectation of success." *Id.* The third element is that "the prior art reference (or references when combined) must teach or suggest all the claim limitations." *Id.*

The relevant facts for finding obviousness relate to (1) the scope and content of the prior art, (2) the level of ordinary skill in the field of the invention, (3) the differences between the claimed invention and the prior art, and (4) any objective evidence of nonobviousness such as long felt need, commercial success, the failure of others, or copying. *Graham v. John Deere Co.*, 148 U.S.P.Q. 459, 467 (1966; see *Continental Can Co. v. Monsanto Co.*, 20 U.S.P.Q.2d 1746, 1750-51 (Fed. Cir. 1991). The Supreme Court in *Graham* stated that "the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be

ascertained; and the level of ordinary skill in the pertinent art resolved.” *Graham*, 383 U.S. at 17, 148 U.S.P.Q. at 467. The *Graham* court further stated that “[s]uch secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.” *Id.*

The examiner maintained his rejection of Claims 1-10 and 12-25 under 35 U.S.C. § 103(a). Specifically, the examiner rejected claims 1-3, 7-10, 12 and 14-16 as being unpatentable over U. S. Patent No. 6,245,184 (“the ‘184 patent”), issued to Riedner *et al.*, in view of U. S. Patent No. 6,236,710 (“the ‘710 patent”), issued to Wittry. Specifically, the examiner stated:

Claims 1-3,7-10, 12,14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riedner et al (6,245,184) in view of Wittry (6,236,710).

Riedner et al teach a process of forming a high-resolution detector by cutting a first number of bars of scintillator with desired dimension; arranging the bars (110) in an array and laminating the bars together with adhesive and introducing a reflector material in between the two scintillator bars (col. 3, lines 5-16).

Riedner et al also teach that cutting a second group of bars (118) from the formed assembly, wherein the cut is perpendicular to the bars and a reflector material (114) is disposed in between the bars (col. 3, lines 16-46 and figure 5).

Riedner et al teach that laminating second group of bars together having reflector material between the adjoining scintillator bars (col. 3, lines 48-63 and figure 6).

Riedner et al fail to explicitly teach the introduction of a polishing step after the cutting step.

However, in a method of manufacturing optical device, Wittry teaches after cleaving a crystal, it is important that the surface be damage free and can be accomplished by etching or polishing or mechanical polishing (col. 4, lines 32-37).

Therefore, it would have been obvious to one of ordinary skill in the art at the claimed invention to combine Wittry's teaching into Riedner et al's process for providing a damage free crystal bars for efficiently laminating the bars together as taught by Wittry.

Applicants respectfully submit that the combination of the '184 and '710 patents does not yield the claimed invention of the present application. There is no motivation to combine such references to accomplish the present invention. Nor is there a reasonable expectation of success of accomplishing the present invention in making such combination.

Riedner *et al.*, disclose a method of fabricating scintillators using an inner diameter (ID) saw. Riedner *et al.*, disclose that a "plurality of scintillators are stacked and cut with the ID saw to form a plurality of first bars. The first bars are placed in a fixture creating a gap which is filled with a cast reflector material. The first bars are then cut with the ID saw at a 90 degree angle to the pieces creating second bars. The second bars are placed in a fixture and spaced to create second gaps similar to the first gaps. The second gaps are filled similar to the first gaps with a cast reflector material forming scintillator array." (see ABSTRACT). Riedner *et al.*, further disclose that during fabrication, "scintillator wafers **100** are temporally bonded together using a low melting point adhesive, dissolvable adhesive, or other temporary adhesive (not shown) to form a stack **104**. ... After cutting, the temporary adhesive bond is broken and first bar stacks **108** are separated into first bars **110**." (see Col. 2, line 62 - Col. 3, line 8).

While Riedner *et al.*, teach the bonding of the scintillator wafers in order to cut the scintillators, the properties of the adhesive are of no concern with the exception that the bonding agent is dissolvable or otherwise temporary. Riedner *et al.*, do not teach that use of a bonding agent with selected optical properties in order to tune the

scintillator block. Nor do Reidner *et al.*, disclose the application of an optical film between layers of scintillators.

In the present application, an optical film is adhered between scintillator crystals using a selected adhesive. Both the optical film and the adhesive are selected in order to tune the scintillator detector array. See, for example, page 7, lines 1 and 2, which states, in part “the detector array can be tuned by selecting the thickness of the optical film **40** thereby allowing selective transmission of light through optical film **40**.” Further, see page 6, lines 23-24, which states in part “the polished bars are coated with an adhesive of selected index of refraction...” The final product, as claimed, is a detector array having an array of discrete elements having a layer of adhesive, a reflective optical film, and another layer of adhesive disposed between adjacent of said discrete elements.

Riedner *et al.*, do not disclose at least the steps of:

polishing said selected number of bars (as admitted by the examiner);

coating the polished bars with an adhesive of a selected index of refraction;

laminating the polished bars together, wherein a thin reflective optical film is disposed between adjoining scintillator bars, wherein said optical film defines a reflector, whereby an assembly of laminated bars having a layer of said optical film between adjoining bars is formed;

allowing the laminated assembly to cure;

repeating these steps in a second direction in order to form the array of the present invention.

Specifically taught by Reidner *et al.*, is the removal of the temporary adhesive and the placement of the individual elements into a spaced arrangement and then the spaces filled with a cast reflective material. Those skilled in the art recognize that such material is used to isolate each element from each other element, thereby preventing cross talk.

While the optical film used and claimed in the present invention is described as being reflective, it is also provided to allow selected transmission of light as discussed above, thereby permitting cross talk between the adjacent elements. Accordingly, it is respectfully submitted that Reidner *et al.*, teach away from the present invention.

In order to maintain the examiner's rejection, it must be shown that Wittry teaches those elements not disclosed by Reidner *et al.* As the examiner has indicated, Wittry discloses that "it is important that the surface be damage free. This may be accomplished by etching or by chemical polishing after cutting and mechanical polishing." (see Col. 4, lines 35-37). In the present invention, it has not been disclosed nor claimed that a "damage free" surface be accomplished. On the contrary, it is understood by those skilled in the art that "polishing" does not typically mean that the surface being polished is "damage free," but that internal trapping of light is minimized. Surface irregularities may remain in order to change the reflection or refraction of light, which aids in the tuning of the crystal.

Wittry also fails to disclose at least those elements of the claimed invention set forth above. Accordingly, it is respectfully submitted that the combination of the '184 and '710 patents as set forth above does not make obvious the invention as claimed in Claims 1-3, 7-10, 12 and 14-16. Therefore, it is respectfully submitted that the examiner's rejection of such claims under 35 U.S.C. 103(a) be withdrawn.

The examiner maintained his rejection of Claims 4-6 and 17-25 as being unpatentable over the '184 and '710 patents in view of U.S. Patent No. 4,879,465 ("the '465 patent"), issued to Persyk *et al.* Specifically, the examiner stated:

Claims 4-6 and 17-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riedner et al (6,245,184) in view of Wittry (6,236,710) as applied to claims 1-3,7-10,12,14-16 above and further in view of Persyk et al (4,879,465).

Modified Riedner et al discussed above in the paragraph 6 but fail to teach forming the detector by bonding together scintillator crystals with different decay times in an alternating pattern.

However, Persyk et al teach forming a high-resolution detector by bonding two different scintillator material having distinguishable decay time in an alternate fashion (col. 2, lines 11-18 and col. 2, lines 65-col. 3, line 3 and abstract) and such arrangement minimizing the edge packing problem.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of claimed invention to combine Persyk et al's teaching into modified Riedner et al's process for advantageously forming a detector with reduced edge packing problem as taught by Persyk et al.

Persyk *et al.*, disclose a detector module for use in scintillation cameras using a plurality of elongated scintillator strips for establishing a temperature gradient. Persyk *et al.*, specifically teach away from the present invention in that they state, at Col. 2, lines 4-10:

While the use of a photomultiplier tube is common in scintillation camera detectors, the use of the tube in this application is unique because the tube is not used to measure anything except the energy of the scintillation event and the decay time of the event. There is no weighting of the signals from a plurality of photomultiplier tubes.

Notwithstanding the admitted divergence from the subject matter of the present invention, Persyk *et al.*, fail to disclose at least those elements lacking in the teaching of the cited prior art and claimed in the present invention. Accordingly, it is respectfully submitted that the combination of the '184, '710 and '465 patents as set forth above does not make obvious the invention as claimed in Claims 4-6 and 17-25. Therefore, it is respectfully submitted that the examiner's rejection of such claims under 35 U.S.C. 103(a) be withdrawn.

Non-rejected Claim

The examiner gave no substantive grounds for rejection of Claim 11. Accordingly, it is presumed that the examiner intended to indicate such claim is allowable. If such presumption is incorrect, it is then respectfully requested that the

indication of finality of the office action be withdrawn such that applicants may be given sufficient opportunity to respond to a substantive rejection.


Summary

In view of the arguments presented herein, it is believed that the above-identified patent application is in a condition for the issuance of a Notice of Allowance. Such action by the examiner is respectfully requested. If, however, the examiner is of the opinion that any of the drawings or other portions of the application are still not allowable, it will be appreciated if the examiner will telephone the undersigned to expedite the prosecution of the application.

Please charge any additional fees associated with this communication, or credit any overpayment, to Deposit Account No. 16-1910.

Respectfully submitted,

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